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WHAT IS CLAIMED IS:

1. A device for treating a cell suspension, comprising:  
a compartment containing a fluid comprising a suspension of hyperproliferative, undifferentiated, or virally infected cells;  
an ultrasound emitter configured to emit ultrasound having a frequency higher than 100 kHz at a power level that is less than  $30 \text{ mW/cm}^2$  for a duration sufficient to cause programmed cell death in said cells without causing significant cavitation or significantly heating the fluid; and;  
a microbubble emitter configured to emit microbubbles with an average diameter of less than 1 mm into the ultrasound field in the compartment.
2. The device according to Claim 1, wherein the gas microbubbles are selected from the group consisting of air and oxygen microbubbles.
3. The device according to Claim 1, wherein the compartment contains physiological fluid extracted from a mammal.
4. The device according to Claim 3, wherein the physiological fluid is selected from one or more of the group consisting of blood, plasma, serum, or cerebrospinal fluid.
5. The device according to Claim 1, wherein the average diameter of the gas microbubbles is less than 50  $\mu\text{m}$ .
6. The device according to Claim 5, wherein the average diameter of the gas microbubbles is less than 30  $\mu\text{m}$ .
7. The device according to Claim 1, wherein the microbubble emitter is situated at the base of the compartment.
8. The device according to Claim 1, wherein the compartment comprises a plurality of ultrasound emitters configured to emit ultrasound continuously or intermittently.
9. The device according to Claim 1, further comprising an electromagnetic radiation emitter.
10. The device according to Claim 9, wherein the electromagnetic radiation emitter emits intermittent radiation at a frequency selected from one or more of the group consisting of ultraviolet radiation (UVA, UVB, UVC), infrared, and microwaves.

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11. The device according to Claim 1, further comprising an apparatus to recover hyperproliferative, undifferentiated, or virally infected cells present in the treated cell suspension.

12. The device according to Claim 11, wherein the apparatus to collect hyperproliferative, undifferentiated, or virally infected cells is selected from the group consisting of a filter and a hydrocyclone.

13. The device according to Claim 1, further comprising a generator configured to supply power to the ultrasound emitter at less than  $1 \text{ W/cm}^2$ .

14. A method of neutralizing, removing and/or preventing the growth of hyperproliferative undifferentiated, or virally infected cells suspended in a physiological fluid comprising:

emitting ultrasound having a frequency higher than 100 kHz into a compartment containing the physiological fluid to be treated at a power level that is less than  $30 \text{ mW/cm}^2$ ; and

emitting gas microbubbles having an average diameter of less than 1 mm into the ultrasound field in the compartment containing the physiological fluid, such that the emission of ultrasound and microbubbles induces significant programmed cell death in the hyperproliferative, undifferentiated, or virally infected cells without causing significant cavitation or significantly heating the fluid.

15. The method according to Claim 14, wherein the gas microbubbles are not ozone microbubbles.

16. The method according to Claim 14, wherein the gas microbubbles are selected from the group consisting of air and oxygen microbubbles.

17. The method according to Claim 14, wherein the physiological fluid is administered to a mammal and/or extracted from a mammal.

18. The method according to Claim 14, wherein the physiological fluid is selected from the group consisting of blood, plasma, serum and cerebrospinal fluid.

19. The method according to Claim 14, wherein the average diameter of the gas microbubbles is less than  $50 \mu\text{m}$ .

20. The method according to Claim 14, wherein the average diameter of the gas microbubbles is less than  $30 \mu\text{m}$ .

21. The method according to Claim 14, wherein the ultrasound emitted into the compartment does not generate a stationary field phenomenon.

22. The method according to Claim 14, further comprising emitting light having an electromagnetic radiation mainly in the visible range into the ultrasound field.

23. The method according to Claim 14, wherein the hyperproliferative cells are selected from the group consisting of tumor cells, bone marrow cells, stem cancer cells, and precancerous cells.

24. The method of Claim 14, wherein the hyperproliferative cells are leukemic cells.

25. The method of Claim 14, further comprising supplying power to the ultrasound emitter at less than  $1 \text{ W/cm}^2$ .

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